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THE COST OF LIFE INSURANCE

THE recently published evidence of the extravagance and misconduct of the officers and directors of the Equitable Life Assurance Society of the United States has aroused the interest of the general public and directed attention to the question of the proper organization and management of life insurance companies. That an examination of the affairs of other companies in the same business will reveal practices fully as reprehensible as any of which the officials of the Equitable are accused, is universally believed. There will undoubtedly be legislative investigations, and more or less wise laws will be enacted by different states for the purpose of promoting honesty and efficiency in the management of life insurance companies and safeguarding the interests of the insured. The only hope of permanent improvement, however, lies in the development of an intelligent interest in the matter on the part of intelligent people; and this interest must reach more fundamental questions than the relative merits of the mutual and the joint-stock forms of organization, or the proper restrictions on the investment of life insurance funds. It will be unfortunate if the present popular interest in the subject exhausts itself on these relatively superficial and subordinate phases of the matter, and fails to reach the most important questions of all: What is the proper cost of life insurance? Are we paying an excessive price for the services life insurance companies are rendering us? It is for the purpose of directing attention to these fundamental questions and throwing some light upon them, that this paper is written.

To most patrons of insurance companies the method of determining premium rates is a profound mystery. It is safe to say that in no other field of economic activity are so many millions of dollars paid by intelligent people with so little idea of the relation between the cost of what they are getting for their money and the price of it, as are paid to life insurance companies by their patrons. This fact is largely due to the absence of a practical check upon prices which exists to a greater or less extent in nearly all other forms of insurance. The price paid for fire insurance, for example, enters as an element into the cost of producing commodities or rendering services of various kinds, and the efforts of competitors in the same line of business to lower their cost of production leads them to put pressure upon the insurance companies for lower rates, and to search actively for the cheapest protection consistent with security. No such restraint exists in the case of life insurance. That form of insurance is in this respect in the position of a consumption good, in the purchase of which the great majority of people are far less careful to secure their money's worth than they are in the purchase of capital goods. Moreover, while the general theory of insurance rates is simple and easily understood, the application of the theory to the calculation of life insurance rates leads to very complex and intricate problems. This is partly due to the long term for which many life insurance policies run, but still more to the bewildering variety of contracts offered by the different companies. The result of the diversity of contracts is not only inability on the part of the prospective policy taker to compare the real cost of insurance in different companies, but a feeling of helplessness before the whole problem. As a prerequisite to an intelligent discussion of the proper cost of life insurance, a somewhat extended consideration of the technique of insurance and the practice of insurance companies is necessary.

Theory of life insurance rates

The general theory of insurance rates is very simple. An insurance premium consists of two parts, known as the net premium and the loading. The net premium makes provision for the payment of indemnities for the losses experienced by the insured; the loading provides for the expense of carrying on the business. If all insurance contracts ran for a short time, as for one year, and the interest on the funds in the hands of the insurance company were disregarded, the net premium for $1,000 of insurance would be ascertained by dividing the total amount of indemnity to be paid by the number of thousands of dollars of insurance issued. Thus if the insurance issued for a year is $1,000,000, and the indemnity to be paid $25,000, the net premium rate is $25 per $1,000. If, however, the premiums are paid at the beginning of the year, and the indemnities at the end of the year, and if the company can earn 4 per cent on the funds while they are in its hands, it would not need to collect $25,000 at the beginning of the year, but only such a sum as, invested at 4 per cent, will amount to $25,000 at the end of the year, or $24,038.46, and the net premium rate will be $24.04 per $1,000. To this net premium must be added such an amount per $1,000 for loading as will bring into the company a fund large enough to cover the expenses of the year. If the expenses amounted to $10,000, the loading would be $10 per $1,000, and the actual premium $34.04.

In one respect it is evident that this calculation is artificially simplified. The amount of loss which will befall a given amount of insurance is by no means fixed and known in advance, but is one of the elements of uncertainty with which insurance companies have to deal. The estimate of future loss is based upon past experience; and where that experience has shown a very fluctuating loss-rate from year to year, it is necessary for the insurance company, if it is to give security, to make a liberal allowance for the extent to which the actual loss in any year may exceed the average for a series of years. Life insurance, however, enjoys a peculiar advantage in this respect. The contingent event with which life insurance contracts deal is the death of the insured, and when enough lives are covered to overcome minor variations, the annual death-rate for each year of life is remarkably constant.

Past experience as to mortality is contained in so called life or mortality tables. Such tables give the number dying at each age of life out of a stated number living at the beginning of that year. There have been a considerable number of such tables worked out on the basis of data derived from different sources. The ones used in the early days of life insurance were based on the experience of the general population, while those now in common use are based on data derived from the observation of insured lives. The two in general use in the United States are the Actuaries' Table, based on the mortality experience of seventeen English companies, and the American Experience Table, based on the records of thirty American companies.[1]

Contracts issued by a life insurance company fall into two general classes; those in which the company binds itself to pay indemnities if the insured die during the term of the policy, and those in which the payment of indemnities is contingent upon the survival of the insured to the end of a stated term. The former are known as life contracts, the latter as endowment

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[1] For purposes of comparison the two tables are here given in condensed form. Column *a* gives the year of life, and columns *b* and *c* the number living at each specified age, out of 1000 living at the age 10, the former by the Actuaries' table, the latter by the American table.

CONDENSED MORTALITY TABLES

a YEAR OF LIFE	*b* ACTUARIES' TABLE	*c* AMERICAN TABLE
10	1000	1000
20	933	926
30	863	854
40	787	781
50	695	698
60	560	579
70	358	386
80	135	145
90	13	85

It will be seen from an examination of the two tables that the American table gives the highest death-rate for the earlier ages, while after the age 40 is reached the mortality indicated by the English table is the higher.

The following table gives in detail the American experience from age 30 to age 40:

AMERICAN MORTALITY TABLE

YEAR OF LIFE	NUMBER OF SURVIVORS OF 1000 LIVING AT AGE 10
30	854
31	847
32	840
33	833
34	826
35	818
36	811
37	804
38	796
39	789
40	781

contracts. The two are frequently embodied in the same policy. In general use the term "endowment" ordinarily refers to a combined life and endowment contract.

If all life insurance were paid for on what is known as the natural premium plan, *i. e.*, if the payment made by each insured at the beginning of each year were intended to cover only the mortality loss and the expense of that year, the calculation of life insurance rates would be as simple as the example given above. If, for example, a person of age 30 proposed to insure his life for one year in a company which used the American mortality table, and which assumed an income of 4 per cent from its investments, the net premium per $1,000 insurance would be ascertained by discounting for one year at 4 per cent an amount sufficient to pay $1,000 to each person dying during that year of life, and dividing the result by the number living at the beginning of the year. According to the table, out of 854 people who enter age 30, 7 die before they reach 31. Hence the premium rate would be ascertained by dividing $7,000, discounted at 4 per cent, by 854, or $7.88 per $1,000. To that net premium must be added the loading, the due share of the expense of carrying on the business for the year. If the same person desired to continue his insurance another year his premium rate would be calculated in the same way, and would amount to $7.95. For the third year it would be $8.01. And as the ratio of those dying during any year of life to those living at the beginning of that year steadily increases with advancing age, the amount of the net premium for a year's insurance would increase *pari passu*.

Such a method of apportioning the cost of insurance is known as the natural premium plan. There are no theoretical objections to it, but a very serious practical difficulty arises from the advancing cost of insurance. In old age that cost becomes practically prohibitive.

A second method of paying for life insurance is by means of a single premium for a term of years, paid in advance. Such a premium for three years' insurance would be calculated as follows: According to the American mortality table out of 854 persons entering the 30th year of life, 7 will die during that year, 7 during the next year, and 7 during the third year. A company which has insured 854 people of age 30 for $1,000 each must pay out $7,000 in indemnities at the end of the first year, $7,000 at the end of the second year, and $7,000 at the end of the third year. Discounting these amounts for one, two and three years respectively at 4 per cent compound discount and adding the results, we find that the present worth of the risks assumed by the company is $19,425.63. That is, that amount in hand at the beginning of the period, invested at 4 per cent compound interest, will yield enough to pay the indemnities as they fall due. If this is divided by 854, the number living at the age 30, the quotient, $22.75, is the amount which the company would need to collect from each of the insured. This is known as the single advance premium.[1] By continuing the process of discounting indemnities for later years the single advance premium for any term of years, or for life, may be ascertained. The insurance for life may be regarded as insurance for a term of years, the term running to the end of the mortality table.

The most prevalent method of paying for life insurance is by means of a uniform annual premium. This premium may be arranged to run for any number of years not exceeding the term of the insurance. The amount of the annual premium may be ascertained by finding how many dollars a man must promise to pay each year for the desired number of years, if living, in order that his promise may be worth as much to the company as the single advance premium for the same kind of policy. Thus in the example just used the single advance premium was $22.75. To change this to a level premium payable for three years, the following method might be used. Find the present value of the promise of a man 30 years old to pay a dollar a year in advance for three years, if he lives. The first payment may be counted at its full value, since it is virtually cash in hand. The second payment, however, must be discounted in the first place for the uncertainty whether the man will live to pay it. As at the beginning of the second year only 847 out of the original 854 persons will be living, the company will receive $847 when it is promised $854. When it is promised a dollar, therefore, it will receive $0.99. And even this amount will be received only after the lapse of a year, and to ascertain its present value it must be discounted for one year. The result is $0.95. The present value of the promise to pay $1 two years from date, if living, may be ascertained in the same way. As there will be only 840 survivors out of the 854 persons, the company will receive only $840 when it is promised $854, or $0.98 for every dollar promised; and this amount discounted for two years becomes $0.91. The sum of these three amounts, $1.00, $0.95 and $0.91, or $2.86, is the present value of the promise of a man aged 30 to pay a dollar a year in advance for three years if living. The single premium payable in advance for three years' insurance was found to be $22.75. If the company is to accept from each of the insured a conditional promise of a certain amount at the beginning of each of the three years in lieu of the single advance payment, and if the present value of such a promise to pay $1 is $2.86, it will be seen that the necessary level premium may be ascertained by dividing $22.75 by $2.86. The result is $7.95, and the level premium must accordingly be $7.95. Insurance paid for by equal annual premiums is said to be issued on the level premium plan.

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[1] This form of contract is comparatively little used in life insurance, but is very prevalent in fire insurance, where three, five, and seven years' insurance are frequently paid for in advance.

It is unnecessary to show in detail how the same method may be applied for any term of years or for life. Moreover, there is no necessity that the term of insurance and the term of premium payments should be the same. Twenty years' insurance or insurance for life may be paid for in ten, fifteen, or twenty equal annual premiums. When the premium term is less than the insurance term, the policy is known as a limited payment policy. Thus we have limited payment life insurance and limited payment term insurance. It is evident that the shorter the term of premium payments, other things being equal, the larger each annual payment must be.

The method of calculating net premium rates for pure endowment insurance differs in no essential respect from the method already described. The chief difference is that the amount of indemnity to be paid by the company is dependent upon the number living at the end of the endowment period and not on the number dying during the term. Thus if 854 persons at age 30 take out 20-year pure endowment policies of $1000 each, the American mortality table shows that at the end of 20 years there will be 698 survivors. The company will have to pay indemnities amounting to $698,000. By discounting that amount for 20 years at 4 per cent compound discount, and dividing the result by the number living at the beginning of the term, the single advance premium of $373.02 is obtained. That can be changed to a level premium for any number of years by the method used with the life insurance premium. If the policy is a combined life and endowment policy each premium is computed separately, and the sum of the two is the required premium. Nor need the life insurance and the endowment insurance run for the same term of years, but, as is sometimes the case, the endowment insurance may terminate at one date and the life insurance continue to a later date or for life.

In the early years of a level-premium life policy, whether a straight life or a limited-payment life policy, and throughout the term of an endowment policy, the company is accumulating out of the net premiums a reserve on the policy, which is generally recognized to-day as the property of the policy-holder, held in trust by the insurance company. In the case of a level-premium life policy the reserve arises from the excess of the actual premium of any year over the natural premium for the same year, increased by the interest earnings. The reserve on such a policy increases every year from the beginning of the policy up to a point somewhere near the middle of the term, when the increasing natural premium becomes equal to the level premium. After that point is passed the company credits itself each year with so much of the reserve on the policy as is necessary to make up the difference between the natural premium and the premium the company is receiving. In this way the entire reserve is used up in paying premiums by the end of the term of insurance. On the policies of the insured who die before the reserve is thus exhausted the company is a gainer by the entire amount of the reserve at the time of death, since the natural premiums of the entire body of policy-holders are sufficient to pay the losses of the group. With a limited-payment policy the process is the same, but the reserve accumulates more rapidly during the early years of the policy, reaches a higher amount at its maximum, and is used up more rapidly during the later years, when the insured is paying no premium.

In the case of a pure endowment policy the reserve consists of the entire net premium increased by interest earnings. If a policy-holder dies before the end of the endowment period his reserve is apportioned *pro rata* among the survivors and helps to make up the endowment indemnities of the group at the end of the period.[1]

The reserve on a policy is the legal property of the insured, carried on the books of a company as a liability. When an indemnity becomes due through the death of a policy-holder, the loss inflicted upon the company is not the full face of the policy, but that amount minus whatever reserve the company is carrying in the name of the policy-holder. During the life of the policy-holder this smaller sum constitutes the net amount at risk on the policy, and at his death it measures the net mortality loss of the company. During the early years of a level-premium life policy this amount diminishes as the reserve increases, while during later years it increases as the reserve diminishes, and becomes again equal to the face of the policy when the reserve is exhausted. In the case of a pure endowment policy, on the other hand, the net amount at risk steadily diminishes as the reserve increases. At the end of the endowment period the reserve is equal to the face of the policy. The maturity of endowment policies, in other words, imposes no loss upon the company.

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[1] It is a mistake to talk about endowment insurance as pure investment. The holders of pure endowment policies who survive to the end of the endowment period derive a profit from the forfeited reserves of those who die before the end of the period, in addition to the interest earnings on their own premium payments. Over against this, however, must be set the cost of administration, covered by the loading added to the net premium, and the question of net gain or loss to the survivor turns upon the relation between these two items. In the case of ordinary endowment policies, which are in reality life and endowment contracts, the whole matter is further complicated by the accompanying life premium which the survivor pays during the whole period, and for which he receives no money return. Those premiums have paid for his "protection" during the endowment period, *i. e.*, they have been used to pay the death indemnities of those who died during the period.

In nearly every state of the union a life insurance company is required by law to have an excess of assets over liabilities equal to the accumulated reserve on all its policies, as calculated on the basis of a mortality table and a rate of interest specified in the law. Hence this reserve is frequently called the legal reserve. Any additional assets of the company constitute the surplus, the property of the company, to which no individual policy-holder has any legal claim, except so far as a share in it may have been properly placed to his credit upon the books of the company. If a company desires to transfer an insurance contract to another company during the term of the insurance, it must transfer at the same time the accumulated reserve on the policy, as without it the second company could not afford to accept the contract. Hence this reserve is often referred to as the re-insurance reserve. While a company possesses net assets equal to the reserve on all its policies it is a solvent company, since it can at any time reinsure its risks and retire from business.

From this examination of the method by which net premium rates are calculated, it is obvious that so long as the different companies use the same mortality tables and the same assumed rate of interest they must reach the same net rates for the same kind of policy. No such uniformity is forced upon them in the matter of loading, the addition made to the net premium to cover the cost of carrying on the business. As a matter of fact, however, there is little difference between the companies in this respect. The loading is calculated as a certain percentage of the net premium, and while there are minor differences for different kinds of policies, the average loading in life insurance is about 25 per cent of the net premium, or 20 per cent of the total premium.

The surplus

If the mortality experienced by a life insurance company and the rate of interest earned on its funds corresponded exactly with the mortality and the interest rate assumed in calculating net premiums, and if the loading for expenses yielded only enough to cover the actual cost of carrying on the business, the insured would be getting their protection at cost price.[1] As a matter of fact, however, the mortality actually experienced by nearly all companies is very materially below the assumed mortality, the interest earned on investments is considerably in excess of the assumed interest, and in economically managed companies the expenses of management do not exhaust the income from loading.

From any or all of these sources the company may receive a surplus income. This extra income is at the beginning the property of the company. In the case of a stock company it may be utilized in any one of three ways. It may be distributed among the stockholders as dividends on stock, it may be returned to the policy-holders, or it may be retained in the possession of the company. When the dividend rate of a stock company is limited by law or by charter, only a definite part of the surplus income can be used in the first way.[2] The remainder of the surplus income, or profit, of stock companies, and the entire profit of mutual companies must be used in the second or the third method. It is necessary to consider briefly each of these methods and its results.

What proportion of the surplus income of the year shall be returned to the policy-holders and what part shall be retained by the company, is arbitrarily determined by the company itself. It was formerly the custom of many companies to carry a fixed proportion of the surplus income to the permanent surplus account and to distribute the remainder among the policy-holders. The result was a fluctuating rate of dividend to the policy-holders, and this fluctuation was found to cause both distrust and dissatisfaction among the policy-holders. The nearly universal practice now is to determine the dividend rate first, and to fix upon a rate low enough to allow of a gradual increase from year to year. When this increase has gone as far as seems desirable, a new minimum rate is selected, and the process of gradual increase begins again.[1] The remainder of the surplus income is carried to the surplus account.

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[1] In the case of a stock company normal interest on the capital actually invested would have to be included as a part of the expense.

[2] The rate of dividend in different stock companies varies widely. Thus, of the twenty-one stock companies reporting to the Minnesota insurance department in 1904, six companies, with an aggregate capitalization of $4,150,000, paid no dividends in 1903; seven, capitalized at $1,365,000, paid 7 per cent; one, capitalized at $1,000,000, paid 8 per cent; four, capitalized at $4,350,000, paid 10 per cent; two, capitalized at $325,000, paid 12 per cent, while the Manhattan, capitalized at $100,000, paid 16 per cent. The average for the companies paying dividends was 8.81 per cent, while for all companies it was almost exactly 6 per cent. It must be noted, however, that in some companies the nominal rate of dividend is no indication of the rate of return on the actual investment. Thus the Prudential has so increased its capitalization by stock dividends that its nominal rate of 10 per cent represents a return of 219.78 per cent on the capital actually paid in in cash.

On annual dividend policies dividends to policy-holders are paid annually. On deferred dividend policies they are more or less formally apportioned annually by the company, but are paid only at the end of the deferred dividend period, usually five, ten, fifteen or twenty years. Many so-called deferred dividend policies are in reality semi-tontine policies, with a contract providing that if the insured dies or allows his policy to expire before the end of the dividend period, he shall forfeit the accumulated dividends on his policy, which shall be carried to the credit of the other policy-holders in the same group.

Such policies are falling into deserved disrepute and are in direct violation of sound insurance principles, introducing an additional element of uncertainty into a business whose one purpose should be to eliminate uncertainty. The claim sometimes put forward that they tend to equalize the cost of insurance by taking from those who die early, and so pay few premiums, and giving to those who live long and pay many premiums, is based on an entirely erroneous conception of the principles of insurance. The premium pays for protection, not for the indemnity. In the case of level-premium life insurance so far is it from being true that those who die early ought to be taxed for the benefit of those who live long, that they are the very ones who are paying an excessive price for their protection, measured by the excess of the level premium over the natural premium at their age.

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[1] The question of the most equitable method of apportioning the surplus income among the policy-holders is one which has received a great deal of attention from insurance experts. In the early days of life insurance crude methods were adopted, such as dividends in proportion to premiums. The present method, known as the contribution plan, is much more scientific and equitable. According to that plan the share which each policy-holder receives from the surplus income is made proportional to his contribution to that income. A detailed description of the method would require an undue amount of space.

The funds left in the hands of insurance companies by holders of deferred dividend and semi-tontine policies are in a somewhat anomalous position. It seems to be the legal rule that when these funds have been definitely apportioned by formal act, and each man's share placed to his credit on the books of the company, the title passes to the policy-holder; but where the funds are carried as an undivided deferred dividend reserve, the individual policy-holder has no legal claim to any share of it. At the same time, in the state of New York, where a special tax is imposed upon the surplus of life insurance companies, the companies insist upon calling this reserve a liability, and their claim has been allowed.[1] Not the least objection to the deferred dividend form of policy is the fact that it increases unnecessarily the funds in the hands of the insurance companies, and leaves a wide margin of available resources at their disposal.

That part of the surplus income of the year's business, which is not credited as dividends either to stockholders or to policy-holders, is carried to the surplus account. The net surplus of a company consists of the excess of the assets over all liabilities including its legal reserve. The life insurance companies reporting to the New York insurance department showed a net surplus on December 31, 1903, of $167,795,982.59 in addition to "special funds," in which were included deferred dividend and tontine reserves of $151,006,074.58. The possession of a surplus is undoubtedly an aid to a company in securing business, giving it an appearance of stability.[1] It is difficult, however, to see any adequate reason for its existence in an old established company under existing conditions. Insurance authorities justify it as a safeguard against either one of two contingencies: a mortality in excess of that indicated by the mortality table, or a fall in the rate of interest below that assumed in calculating net premiums. How slight the probability is that either of those events will occur, will be evident when we study the actual experience of the companies.

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[1] In this connection it is interesting to note that during the year 1903 the following companies reported a reduction of this deferred dividend and special reserve fund to the extent indicated: Mutual Life, $5,954,379.45; New York Life $2,557,060.24; National Life, $21,967.49; Prudential, $214,215.05. The relatively small reductions in the case of the National Life and the Prudential might easily be brought about in the natural course of business. The presumption that the other companies used the funds for other purposes than those for which they had ostensibly been set aside is strengthened by the fact that in spite of dropping these larger amounts from the liability side of the ledger, the business of the year showed a net loss in the case of the Mutual, while the New York Life came out exactly even.

After a company has accumulated a surplus, interest on such surplus is an item in its income account. When the premium income plus the interest on the reserve is sufficient to meet all liabilities and keep up the legal reserve, the interest on the surplus is all profit to the company, swelling the surplus income to be distributed at the end of the year. In practice, however, the reserve and the surplus are not kept distinct, but the income from all the invested funds of the company is compared with the interest necessary to keep the reserve up to the legal requirements, and any excess in the amount realized is carried to the profit of the company.

In calculating the net investment income many life insurance companies and insurance departments attempt to divide the total expense of the year into two parts, the insurance expense and the investment expense. The insurance expense is then charged against the loading, and the investment expense against the interest account. In practice one result of this method of book-keeping seems to be to enable a company to increase its insurance expense up to the full amount of the loading.

The appreciation or depreciation of securities and of real estate is the source of considerable gain or loss to an insurance company on account of the large funds it has invested in such property. This item does not appear in the annual reports given to the public by the life insurance companies themselves, and is rarely found in the reports of the state insurance departments. It is an item of general interest to the public and ought to appear plainly on the balance sheets of the company.

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[1] This probably explains why the Equitable publishes to the world a surplus of over $70,000,000.00, while claiming before the New York tax department that its real surplus is a little over $10,000,000.00.

One more possible source of gain or loss to an insurance company remains to be noted. Nothing has been said as yet about the effect produced upon the financial condition of a company by the premature withdrawal of policy-holders. Nearly all life insurance companies now pay a certain sum in the form of cash or of an equivalent amount of extended or paid-up insurance to any of their policy-holders who fail to keep up their payments to the company, provided they have already made three full annual payments. This is known as the surrender value of the policy, and is equal to the net premium reserve on the policy at the time of surrender, minus a certain percentage which the company retains. If the policy-holder withdraws before the third annual premium has been paid, no surrender value is usually allowed. In that case the policy is said to lapse. On every lapsed or surrendered policy the company makes a profit equal to the difference between the net reserve on the policy and the surrender value, if any, allowed by the company.

It is not generally realized what a small proportion of the life insurance taken out is carried to its natural termination. The report of the Connecticut insurance department contains a table showing the percentage of the total number of policies terminated in a year by each of six methods: by death (life policies); by maturity (endowment policies); by expiry (term policies); by surrender, by lapse, and by change and decrease.[1] If we call the first three modes of termination the regular methods, and the last three the irregular methods, we find that the percentage of the total insurance which falls in the former class varies from 3.50 (Hartford Life) to 79.58 (Provident Savings). The average of regular terminations for the 31 companies reporting to the department was 35.21 per cent of the total terminations, leaving 64.79 per cent as the share terminated irregularly, of which all but 5 per cent was by lapse or surrender.[1] So important is this item of lapsed and surrendered policies becoming that tables are constructed, showing the probable withdrawals in the same way that mortality tables show probable deaths.

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[1] As returned by many insurance companies, the reports of policies terminated contain another class called "not taken." This shows the number and amount of the policies actually made out by the companies and entered on the books on which the first premium was never paid. The companies operating in New York state in 1903 reported to the insurance department an aggregate of 82,927 policies under this head carrying $172,793,472 of insurance. The Connecticut department takes no account of the "not taken" policies in calculating its percentages.

It is by no means easy to decide just what treatment policyholders surrendering their policies before the regular time ought to receive. Such withdrawals exercise an unfavorable influence upon the mortality of the company, since healthy persons are more ready to let their insurance drop than are those who are conscious of physical weakness. The tendency of companies in recent years has been to lessen the sacrifice involved in surrendering a policy by increasing the size of the cash surrender values allowed, and the consequence is seen in an increasing proportion of surrendered policies. On every such policy the company makes an immediate profit, but what the final effect upon the company will be can be determined only after time has shown the effect of the withdrawals upon the mortality of the group.[2]

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[1] Industrial insurance experiences very large percentages of lapsed and surrendered policies. Of the business terminated by the four industrial companies in Connecticut during the year 1903, 4.41 per cent was terminated by surrender, and no less than 90.10 per cent by lapse. This represents an enormous tax upon the resources of the laboring classes.

[2] Certain minor sources of gain or loss may deserve mention. The most important of them is the annuity account. The annuity business of insurance companies is a recent development, and comparatively few companies have as yet taken it up. It has generally been unprofitable for the companies. Of the twenty-five companies reporting annuity business for 1903 to the Minnesota insurance department, twenty-one had experienced a loss on the business during that year, and only four reported a gain. Other scattering items of gain or loss appear in the reports of the companies, for some of which, even when they are of very considerable magnitude, it is impossible to discover the source. Thus in the report of its business for 1903 the Mutual Life Insurance Company charges against the interest account the following item: "Profit and loss item—loss, $654,809.96." The only distinguishable items in its report of income and disbursements which are carried to that account are the profit and

Financial results of insurance practice

The following analysis of the financial results of life insurance practice is based upon the 1904 reports of the insurance departments of Connecticut, Illinois, Massachusetts, Minnesota, New York and Ohio, and covers the business of twenty-four companies for the twelve months ending December 31, 1903. All the life insurance companies which reported to all the departments are included, except the John Hancock, the Metropolitan and the Prudential, a large part of whose business is industrial insurance. The list of companies, together with the statistics concerning them used in this paper, will be found in the accompanying table. The attempt is made to bring out clearly in the table not only the relation between the total income and the total expense of each company for all the companies, but also the state of each of the separate accounts to which the different parts of the income are theoretically assigned. Let us begin with an examination of the mortality account of the companies.

Column 5 gives the net mortality loss to be expected by each company during the year according to the mortality table; *i. e.*, the sum of the indemnities the company has prepared to pay minus the sum of the reserves it has accumulated on the policies to fall due. Column 6 gives the actual net mortality loss experienced by each company, and column 7 gives the ratio of the latter to the former. It will be seen that no company experienced a mortality loss as large as it had prepared for. The rate per cent of the actual loss to the anticipated loss varied from 57 to 89. The average rate per cent for all the companies combined was 76. There were fourteen companies with rates below the average, and ten with rates above it. The average is raised by the relatively high rate of a few of the larger com-

loss on the sale or maturity of ledger assets. But these two items show a balance in favor of the company of $778,141.41, thus increasing the unexplained loss to $1,432,951.37. This item does not include decrease in market values, which is entered separately. There is also an unexplained "suspense" credit of $956,060.52 in the same report. In the report of the New York Life Insurance Company for the same year appears an item: "Profit and loss items—gain, $800,592.89." The net profit on sale or maturity of ledger assets was $262,100.89. The source of the balance of the gain cannot be determined from the report.

BUSINESS OF INSURANCE COMPANIES, 1903

1	2	3	4	Mortality, net			Interest Earnings			11	Insurance Expenses			15
				5	6	7	8	9	10		12	13	14	
No.	Name of Company	Capitalization[1]	Premium Income, 1903[2]	Expected[3]	Actual[4]	Per Cent[5]	Interest Required[6]	Net Interest Receipts[7]	Per Cent[8]	Interest Rate Per Cent on Mean Assets[9]	Loading[10]	Actual Expenses[11]	Per Cent[12]	Management Expense Per $1,000 Insurance[13]
1	Ætna	$2,000,000	$8,896,452 83	$2,471,163 00	$1,621,252 91	66	$2,240,187 87	$2,679,388 88	119	4.24	$1,701,084 07	$1,789,469 40	105	$8 21
2	Conn. Mutual	....	5,325,082 06	2,413,075 50	1,930,565 18	80	2,112,788 40	2,408,713 81	114	3.82	1,025,562 79	869,650 99	85	5 48
3	Equitable............	100,000	58,637,889 63	14,684,533 00	13,124,807 94	89	10,829,037 96	13,638,526 98	126	3.70	14,562,639 99	14,081,741 24	97	9 98
4	Fidelity Mutual	....	3,145,652 32	1,376,556 04	936,629 77	68	190,077 84	230,052 34	121	4.49	1,112,015 04	1,092,784 84	98	11 42
5	Germania	200,000	4,172,164 38	885,980 05	642,119 97	72	1,063,627 19	1,290,232 18	121	4.17	974,627 88	1,091,238 40	112	11 29
6	Home	125,000	2,747,783 03	701,677 00	486,279 95	69	528,555 00	581,148 72	110	4.20	592,282 01	765,281 18	129	11 80
7	Mass. Mutual	....	6,015,010 75	1,778,000 00	1,143,266 90	64	1,146,000 00	1,319,021 20	115	4.31	1,523,000 00	1,179,628 36	77	7 37
8	Mutual Benefit	....	12,672,873 35	4,854,850 00	3,794,356 00	78	3,094,687 20	3,638,692 44	117	4.56	2,623,366 69	2,150,051 98	82	7 11
9	Mutual Life	....	60,151,019 66	15,465,272 29	12,148,765 83	79	12,650,350 00	15,231,240 40	120	3.96	13,232,103 61	14,641,421 17	112	10 52
10	National	....	5,224,447 87	1,298,138 25	737,742 25	57	957,532 95	1,158,139 92	121	4.49	966,693 18	1,200,908 39	124	10 01
11	New Eng. Mutual ...	....	4,932,087 68	1,644,930 87	1,223,700 18	74	1,269,957 49	1,412,868 91	111	4.11	1,135,591 74	1,102,744 86	97	7 92
12	N. Y. Life...........	....	73,382,174 10	16,721,630 00	12,129,776 53	73	11,120,311 00	13,231,004 96	119	4.17	16,830,852 27	17,148,038 78	102	10 54
13	Northwestern........	....	26,155,649 60	6,270,110 00	4,135,552 35	66	5,146,997 92	7,282,040 88	141	4.21	5,834,402 86	4,467,134 06	77	6 56
14	Penn Mutual	....	11,848,666 89	3,114,021 00	2,007,878 23	64	2,167,729 00	2,436,302 77	112	4.58	2,945,327 79	2,323,588 26	79	8 63
15	Phœnix	....	2,969,605 94	832,365 00	638,162 00	77	612,863 00	763,834 00	125	4.80	581,771 00	731,483 00	126	10 23
16	Prov. Life & Trust...	1,000,000	6,391,882 09	1,562,492 94	954,785 00	61	1,723,647 50	2,127,588 79	123	4.30	1,151,263 19	1,264,889 65	110	8 55
17	Prov. Savings........	100,000	3,646,220 86	1,412,931 00	1,218,992 40	86	219,187 83	258,805 43	118	4.05	1,253,714 56	1,357,306 34	108	14 98
18	Security Mutual	....	1,211,808 34	514,581 00	364,746 19	71	32,435 00	48,408 31	149	3.96	463,631 54	635,108 00	137	16 01
19	State Mutual	....	3,652,184 47	1,028,946 64	819,281 95	80	793,076 84	939,484 81	118	4.28	848,479 16	823,014 40	97	8 34
20	Travelers'	....	4,303,999 65	1,263,000 00	1,031,477 00	82	1,074,592 00	1,293,743 67	120	4.27	382,995 17	792,666 14	207	6 38
21	Union Central	100,000	6,667,073 27	1,817,330 00	1,041,176 00	57	1,198,872 00	2,058,082 83	172	5.72	1,214,431 90	1,341,680 43	110	7 10
22	Union Mutual	....	1,978,288 65	594,430 00	399,543 65	67	362,170 00	370,630 88	103	3.81	492,572 35	648,464 47	132	11 60
23	United States........	440,000	1,411,486 43	446,400 00	375,727 73	84	372,819 54	397,573 82	107	4.69	422,104 36	534,471 10	127	11 96
24	Washington	125,000	2,789,089 08	616,981 00	547,110 00	89	670,169 00	715,457 02	107	4.35	644,359 85	948,774 30	147	14 62

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[1] N. Y. p. xxxii. [2] N. Y., p. xxxi. [3] Minn. p. xxxiv. [4] Minn. p. xxxiv. [5] Minn. p. xxxi. [6] Minn. p. xxxvii. [7] Minn. p. xxxvii.
[8] Calculated. [9] Conn. p. 682. [10] Minn. p. xxxvi. [11] Minn. p. xxxvi. [12] Minn. p. xxxvi. [13] Conn. p. 683.

BUSINESS OF INSURANCE COMPANIES, 1903—*Concluded*

No.	Name of Company	Surrender Values			Gain and Loss Exhibit.[4] (In Nearest Thousands. Gains +; Losses, —.)											No.
		16 Reserves[1]	17 Values Paid[2]	18 Per Cent[3]	19 Mortality	20 Surrenders	21 Loading	22 Interest	23 Annuities	24 Changes in Market Values	25 Miscellaneous Items	26 Combined Gain or Loss	27 Stock Dividends	28 Dividends to Policy Holders	29 Net Gain or Loss	
1	Ætna	$848,555 00	$674,063 57	79	+ $850	+ $174	— $194	+ $544	....	— $284	— $6	+ $1,085	$194	$679	+ $212	1
2	Conn. Mutual	644,285 00	581,393 77	90	+ 483	+ 63	+ 164	+ 304	— $1	— 769	— 156	+ 88	....	1,360	— 1,272	2
3	Equitable	8,914,822 28	7,434,119 04	83	+ 1,560	+ 1,481	+ 481	+ 2,809	— 7	— 3,051	+ 10	+ 3,282	7	5,682	— 2,407	3
4	Fidelity Mutual	154,556 53	122,428 97	79	+ 440	+ 32	+ 19	+ 40	— 0	— 15	+ 3	+ 519	....	45	+ 474	4
5	Germania	496,074 40	335,200 17	68	+ 240	+ 158	— 115	+ 223	— 8	— 68	— 22	+ 409	24	198	+ 187	5
6	Home	280,307 00	151,932 13	54	+ 215	+ 163	— 273	+ 153	— 14	— 180	— 4	+ 60	15	231	— 186	6
7	Mass. Mutual	703,510 00	597,196 88	85	+ 640	+ 107	+ 345	+ 174	....	— 228	— 108	+ 930	....	828	+ 102	7
8	Mutual Benefit	1,674,955 00	1,483,005 60	89	+ 1,060	+ 192	+ 473	+ 544	— 22	— 273	— 117	+ 1,858	....	1,837	+ 21	8
9	Mutual Life	5,737,919 00	3,963,060 88	69	+ 3,272	+ 1,775	— 1,409	+ 2,581	....	— 8,723	— 655	— 3,159	....	2,994	— 6,153	9
10	National	681,438 92	571,718 81	84	+ 560	+ 110	— 234	+ 200	— 20	— 104	— 28	+ 484	....	162	+ 322	10
11	New Eng. Mutual	781,018 34	682,632 94	87	+ 421	+ 98	+ 33	+ 143	....	— 417	+ 5	+ 283	....	549	— 266	11
12	N. Y. Life	11,147,602 58	8,647,841 26	78	+ 4,592	+ 2,500	— 317	+ 2,110	+ 15	— 6,616	+ 801	+ 3,085	....	5,450	— 2,365	12
13	Northwestern	3,414,145 00	2,975,072 71	87	+ 2,135	+ 439	+ 1,367	+ 2,135	— 9	— 77	— 907	+ 5,083	....	4,456	+ 627	13
14	Penn Mutual	1,049,501 00	882,464 02	84	+ 1,106	+ 179	+ 622	+ 268	— 5	— 379	— 38	+ 1,752	....	785	+ 967	14
15	Phœnix	340,603 00	256,787 00	75	+ 194	+ 84	— 150	+ 151	— 3	— 13	+ 11	+ 274	....	265	+ 9	15
16	Prov. Life & Trust	622,526 67	571,103 85	92	+ 608	+ 51	— 250	+ 530	— 19	— 875	+ 100	+ 146	....	818	— 672	16
17	Prov. Savings	285,861 00	248,428 77	87	+ 194	+ 37	— 104	+ 40	— 4	— 40	+ 65	+ 188	7	139	+ 42	17
18	Security Mutual	61,619 00	22,171 80	36	+ 150	+ 39	— 176	+ 14	....	— 3	+ 3	+ 27	....	5	+ 22	18
19	State Mutual	460,358 81	391,133 67	85	+ 210	+ 69	+ 25	+ 146	....	— 229	+ 80	+ 303	....	463	— 160	19
20	Travelers'	622,530 00	306,797 66	49	+ 232	+ 316	— 410	+ 219	— 7	— 459	+ 78	— 32	....	....	— 32	20
21	Union Central	505,259 00	445,501 28	88	+ 776	+ 62	— 338	+ 1,070	— 8	+ 9	— 31	+ 1,539	10	450	+ 1,079	21
22	Union Mutual	228,409 60	138,875 80	61	+ 192	+ 88	— 158	+ 8	+ 0	— 135	— 45	— 51	....	74	— 125	22
23	United States	373,137 82	199,358 75	53	+ 71	+ 175	— 112	+ 25	+ 1	+ 10	— 40	+ 129	31	111	— 13	23
24	Washington	417,988 82	221,367 70	53	+ 20	+ 116	— 198	+ 48	+ 2	+ 80	+ 0	+ 68	9	156	— 97	24

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[1] Minn. p. xxxiv. [2] Minn. p. xxxiv. [3] Minn. p. xxxiv. [4] These figures are taken from the reports of the individual companies as published in the Minnesota Insurance Report, 1904.

panies, notably the Equitable (89 per cent), the Provident Savings (86 per cent), and the Mutual (79 per cent). It seems therefore that the mortality tables now in use indicate a mortality loss nearly a third larger than the loss actually experienced. In fact, so far is it from being the case that the mortality table used indicates the mortality actually expected, that conservatively managed companies which exercise care in the selection of risks consider an actual mortality loss of 80 per cent of the indicated loss as distinctly unfavorable. The difference between the amounts in column 5 and those in column 6 forms part of the surplus income or profit of the year, and appears as the first item in the gain and loss exhibit (see column 19).[1] The actual gain of the twenty-four companies from this source during the year 1903 was $20,315,698.67. The premium income of the companies for the same year was, according to the New York report, $318,328,592.93. The profit from mortality, therefore, was nearly 6.5 per cent of the entire premium income.

The second element of the income to consider is the interest earnings of the reserve. Column 8 gives the amount of interest required according to the rate assumed by the companies in calculating net premiums. Column 9 gives the net interest earnings on all the invested funds of the companies, the amount being obtained by subtracting the investment expense of each company from its gross interest income. Column 10 gives the ratio of the actual interest obtained during the year to that required. This column shows that the net interest income of every one of the companies was more than sufficient to meet the requirements of the reserve. The ratios vary from 103 per cent to 172 per cent. The average for all companies is 122 per cent, and there are eighteen companies with rates below the average, while only six companies have rates above it. The total profit realized by the companies from this source was

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[1] The figures in column 19 are taken from the detailed reports of the different companies contained in the Minnesota report, from which columns 5 and 6 are also compiled. Unfortunately, as in many other instances, there are discrepancies between the different parts of the same report which it is impossible to reconcile with the data available.

$13,878,711.42, which is 4.4 per cent of the premium income. This indicates nothing definite as to the real adequacy of the assumed rate of interest, since a considerable part of the gross interest income is earned by the surplus. Column 11, however, gives the net rate of interest actually earned by each of the companies as calculated by the Connecticut insurance department on the basis of the mean amount of admitted assets for the year. This table shows rates varying from 3.70 per cent to 5.72 per cent. Five companies have rates below 4 per cent, eighteen between 4 per cent and 5 per cent, while one company, the Union Central, earned more than 5 per cent (5.72 per cent). The average of the rates is 4.3 per cent.[1] Meantime these same companies are calculating reserves on the basis of interest earnings of 3 or 3½ per cent. It is safe to say that the rate actually realized on investments is 1 per cent in excess of the tabular requirement.

The comparison of the loading and the expense account of the twenty-four companies may be made on the basis of columns 12, 13 and 14, the last column giving the ratio of the insurance expense of each company to its income from loading. This ratio is very diverse, varying from 77 per cent in the Massachusetts Mutual and the Northwestern to 207 per cent in the Travelers'. The average for all the companies combined is 100.5 per cent. Only nine companies have rates below the average, while fifteen run above it. Among the companies with a low rate, however, are several of the large companies, including the Massachusetts Mutual (77 per cent), the Northwestern (77 per cent), the Penn Mutual (79 per cent), the Mutual Benefit (82 per cent), and the Equitable (97 per cent). It may fairly be said, therefore, that it requires no excessive degree of economy to enable an insurance company to keep its expenses within the limits imposed by the loading, while some companies make a large saving from that source. In this connection column 15 is of interest as showing the cost of administration of the different companies per $1000 of mean insurance in force. This rate shows an extremely wide fluctuation, varying from $5.48 (Connecticut Mutual) to $16.01 (Security Mutual). There seems to be no very close connection between the rates thus established and those shown in column 14 beyond a general tendency to vary in the same direction.

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[1] The average rate for the thirty companies included in the Connecticut report is 4.09 per cent. This average is kept down by the low rate realized by some of the companies with large assets, notably the Prudential (3.63 per cent), the Equitable (3.70 per cent), the Connecticut Mutual (3.82 per cent), the Mutual Life (3.96 per cent), and the Metropolitan (3.98 per cent).

Columns 16, 17 and 18 show the results of the dealings of the companies with their withdrawing policy-holders. Column 16 indicates the amount of the reserve carried in the name of these policy-holders; column 17, the amount actually paid to the policy-holders on their withdrawal; and column 18, the relation between the two. The last column shows that the surrender values allowed varied from 36 per cent (Security Mutual) to 92 per cent (Provident Life and Trust) of the full reserve on the surrendered and lapsed policies. The balance, therefore, varying from 8 per cent to 64 per cent of such reserves, became an item of profit to the companies. For the whole twenty-four companies, 21.4 per cent of the reserves on surrendered or lapsed policies was thus retained. Ten companies retained a larger percentage than the average, fourteen companies less than the average.[1] The full reserve on all surrendered and lapsed policies was $40,446,983.77, and the surrender values paid $31,903,657.03, leaving a profit for the twenty-four companies of $8,543,326.74. This is 2.7 per cent of the premium income.

The actual gain or loss of each company from each of the sources examined is embodied in columns 19 to 22. Column 23 gives the result of the annuity business, column 24 the net result of changes in the market value of real estate and securities, and column 25 the balance of other profit and loss items. Finally, the net result of the business of the year is summed up in column 26, which shows the net gain or loss of each company for the year. The general shrinkage in market values which occurred in 1903 is reflected in column 24. Only three companies could record a net gain from changes in market values, while twenty-one reported losses. For many companies the losses were large, the maximum being reached by the Mutual, which reports a loss of $8,723,000 from this source. In spite of this unusual form of loss for the year, column 26 indicates that only three companies, the Mutual, the Travelers' and the Union Mutual failed to make a profit on the year's business. The aggregate loss of the three was $3,242,000. The aggregate gain of the other twenty-one companies was $21,592,000, leaving a favorable balance for all companies of $18,352,000.

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[1] The proportion of the reserve returned to withdrawing policy-holders is not necessarily indicative of the attitude of the company toward them. It is largely influenced by the proportion of withdrawals during the first two years of the life of the policies, when no surrender values are allowed.

Of this surplus income a small amount was paid out in dividends to stockholders, as shown in column 27, and a much larger part was apportioned among the policy-holders. The total appropriations for these two objects exceeded the total profit for the year, and just one-half of the companies were left with a final unfavorable balance. Column 29 shows the amount finally carried to the account of surplus or of special funds. The entire business of the twenty-four companies shows a net loss for the year of somewhat over $9,000,000. It must be borne in mind, however, that the net shrinkage in the value of real estate and securities far more than accounted for this falling-off in surplus. The net loss from that source was about $23,000,000. If that loss had been escaped, the deficit of $9,000,000 would have been replaced by a surplus of $14,000,000, the amount realized from the insurance business itself, after $28,000,000 had been returned to the policy-holders in the form of dividends.

Conclusion

Whether we reach our results by an analysis of the elements of the income of insurance companies and the relation of each element to the purpose to which it is theoretically assigned, or examine directly the gain and loss account of the insurance companies, the same conclusion is forced upon us, that the premium rates are unnecessarily high. We have seen that the average experience of twenty-four companies shows a saving on mortality of over 20 per cent, an excess of interest earnings of nearly or quite 1 per cent, and a generous profit from lapsed and surrendered policies, while the loading is just sufficient to cover the cost of carrying on the business. The gain and loss exhibit indicates that but for the depreciation of securities during the year 1903 the insurance operations of that year would have brought in to the companies a profit of more than $40,000,000 to be returned to the policy-holders, or added to the surplus. With no improvement in the methods and practices of insurance companies, a reduction of 20 per cent or 25 per cent in premium rates is possible for a company managed with average care and efficiency, and is in every way desirable.

But to bring insurance rates down to the present cost-level is only half enough. The cost itself ought to be lowered. It is demonstrable that some of the practices of insurance companies tend to increase their mortality loss, that a higher net rate of interest could be secured on their investments, and that the cost of administration is often extravagantly high. Improvement in any of these particulars would materially lower the cost of insurance, and make possible a further reduction in premium rates, resulting in a wider utilization of the benefits of insurance by people of small or moderate income.

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